Site: Pear	**Overall Confidence Rating: Medium**

Background: A total of 70,530 acres are planted in pears in the United States. Organophosphate pesticides (OP) represent 55.6% of all insecticide usage on this crop with an average of 2.8 applications per year. Analysis of OP usage was conducted for two regions; 1) California and 2) Pacific Northwest (Washington and Oregon). These 2 regions reflect 92.6 % of pear production in the United States and 96.8% of production. Analysis was conducted over data available for the years 1994 - 1996.

Organophosphate Pesticides	% Treated		# Applications		Rate (lb AI/A)		PHI (days)	
	Max	Avg	Max	Avg	Max	Avg	Min	Avg
azinphos-methyl	80.0	75	NS		3.1		15	
chlorpyrifos	13.0	8.0	1/1 yr	1.0	3.0	2.1	NS	
diazinon			NS		5.0		21	
dimethoate	10.0	5.5	NS		2.0		28	
malathion	4.0	1.0	NS	1.0	--	1.0	1	
methyl parathion	14.2	7.0	NS		2.0		NS	
phosmet			NS		5.0		NS	

Confidence Rating: H= high confidence = data from several confirming sources; confirmed by personal experience
M = medium confidence = data from only a few sources; may be some conflicting or unconfirmed info.
L = low confidence = data from only one unconfirmed source

Pests Targeted by Organophosphates in California	
Major	Mites (European Red, Twospotted Spider, Pacific Spider, McDaniel Spider, Brown, Pearleaf Blister) and Codling Moth
Moderate	-none-
Minor	Scale (San Jose and Italian Pear) and Aphid (Green Peach, Bean, and Melon (Cotton))

Major = 20+% of all OP usage on pest; Moderate = 5-20% of all OP usage on pest; Minor =<5% of all OP usage on pest

Pests Targeted by Organophosphates in the Pacific Northwest (Washington and Oregon)	
Major	Codling Moth and Mealybug (Grape)
Moderate	Mites (European Red, Pearleaf Blister, Twospotted Spider, Pear Rust, McDaniel Spider,and Brown) Pear Psylla, Bugs (Tarnished Plant, Bill, Stink, Red, and Lygus), and Aphid (Green Apple)
Minor	-none-

Major = 20+% of all OP usage on pest; Moderate = 5-20% of all OP usage on pest; Minor =<5% of all OP usage on pest

Sources:

1. Proprietary EPA market share information.
2. QUA+ - Oregon. 1997.
3. QUA+ - Washington 1997.
4. Integrated Pest Management for Apples & Pears. 1991. University of California. Publication 3340.
5. Pacific Northwest 1998 Insect Control Handbook. 1998. Oregon State University.
6. Orchard Pest Management: A Resource Book for the Pacific Northwest. 1993. Good Fruit Grower, Yakima, Washington.
7. 1998 Crop Protection Guide for Tree Fruits in Washington. 1998. Cooperative Extension Washington State University. Publication EB0419.
8. Integrated Pest Management for Apples & Pears. 1991. University of California, Statewide IPM Project. Publication 3340.
9. Pear Pest Management Guidelines. 1995. University of California, Davis, UCPMG Publication 16.
10. The All-Crop, Quick Reference Insect Control Guide (1997), Meister Publishing Company.
11. Label Use Information System (LUIS) Version 5.0, EPA. Date: 8/6/98

Site: Pears
Region: California

Pest[2, 3, 4]	Organophosphate[1, 2, 3, 4]	Efficacy[2, 3]	Mkt[1]	Class	Alt. Pesticide List[1, 2, 3, 4]	Efficacy[2,3]	Mkt[1]	Constraints of Alternatives
Timing: **Pre-Bloom**								
Mites	azinphos-methyl[6]	---	High	P	esfenvalerate	---	Lo	Pyrethroids may disrupt biological control of mites resulting in increased miticide application with the potential for development of resistant populations.
(Major)	diazinon	---	Lo	O	chinomethionate	—	Lo	
	methyl parathion	---	Lo	O	clofentezine	—	Lo	
				O	fenbutatin oxide	---	Lo	
				O	formetanate hydrochloride	---	Lo	
				O	insecticidal soap	---	—	
				O	petroleum oil	---	Mod	

ADDITIONAL INFORMATION:

Pear production in California represents 33.6% of national acreage (bearing) and 38.6 of production. OP's represents only 11.1% of all pesticides used during the Pre-Bloom period on pears in California.

SOURCES:

1. Proprietary EPA market share information.
2. Integrated Pest Management for Apples & Pears. 1991. University of California, Statewide Integrated Pest Management Project. Publication 3340.
3. Pear Pest Management Guidelines. 1995. University of California, Davis, UCPMG Publication 16.
4. The All-Crop, Quick Reference Insect Control Guide (1997), Meister Publishing Company.
5. Label Use Information System (LUIS) Version 5.0, EPA.
6. New 1998 restrictions for azinphos-methyl use in California may change use patterns of this pesticide.

Date: 8/6/98

Site: Pears
Region: California

Pest[2, 3, 4]	Organophosphate[1, 2, 3, 4]	Efficacy[2, 3]	Mkt[1]		Class	Alt. Pesticide List[1, 2, 3, 4]	Efficacy[2,3]	Mkt[1]	Constraints of Alternatives
Timing: **Post-Bloom**									
Codling Moth (Major)	azinphos-methyl[6]	---	High		C	carbaryl	---	---	Carbamate and Pyrethroid use will disrupt IPM programs dependent upon biological control of mites. Use of these products could result in increased miticide applications with potential for development of resistant mite populations. Pheromone disruption of mating is only effective against low population densities and is not effective in all areas.
	chlorpyrifos	---	Lo		P	esfenvalerate	---	Lo	
	diazinon	---	Lo		P	permethrin	---	Lo	
	dimethoate	---	---		CH	dicofol	---	Lo	
	parathion	---	Mod		CH	endosulfan	---	---	
	phosmet	---	Mod		B	Bacillus thuringiensis	---	Lo	
					O	petroleum oil	---	Lo	
					O	pheromone	---	---	
					O	sulfur	---	Lo	
Scale (San Jose and Italian Pear) (Minor)	azinphos-methyl[6]	---	Lo		O	petroleum oil	---	High	
	chlorpyrifos	---	Mod						
	diazinon	---	Mod						
	methyl parathion	---	High						
Aphid (Minor)	azinphos-methyl[6]	---	High		C	carbaryl	---	Lo	
	diazinon	---	Mod		C	methomyl	---	Lo	
	malathion	---	Lo						

ADDITIONAL INFORMATION:
Pear production in California represents 33.6% of national acreage (bearing) and 38.6 of production. OP's represent 62% of all pesticide usage on pears during the Post-Bloom period in California.

Pest Importance: Major = 20+% of all OP usage on pest; Moderate = 5-20% of all OP usage on pest; Minor = <5% of all OP usage on pest
Efficacy Rating: Excellent = ☺ Good = ❍ Fair = ●
Market Share: High = use of OP represents 20+% of all insecticide usage on pest; Med = 5-20% of all usage on pest; Lo = <5% of all usage on pest
Insecticides: C = Carbamates; P = Pyrethroids; CH = Chlorinated Hydrocarbons; IGR = Insect Growth Regulators; B = Biological; O = Other pesticides

Site: Pears
Region: California

SOURCES:

1. Proprietary EPA market share information.
2. Integrated Pest Management for Apples & Pears. 1991. University of California, Statewide Integrated Pest Management Project. Publication 3340.
3. Pear Pest Management Guidelines. 1995. University of California, Davis, UCPMG Publication 16.
4. The All-Crop, Quick Reference Insect Control Guide (1997), Meister Publishing Company.
5. Label Use Information System (LUIS) Version 5.0, EPA.
6. New 1998 restrictions for azinphos-methyl use in California may change use patterns of this pesticide.

Date: 8/6/98

Pest Importance: Major = 20+% of all OP usage on pest; Moderate = 5-20% of all OP usage on pest; Minor = <5% of all OP usage on pest
Efficacy Rating: Excellent = ☺ Good = ❍ Fair = ●
Market Share: High = use of OP represents 20+% of all insecticide usage on pest; Med = 5-20% of all usage on pest; Lo = <5% of all usage on pest
Insecticides: C = Carbamates; P = Pyrethroids; CH = Chlorinated Hydrocarbons; IGR = Insect Growth Regulators; B = Biological; O = Other pesticides